

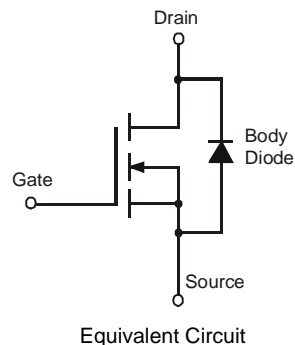
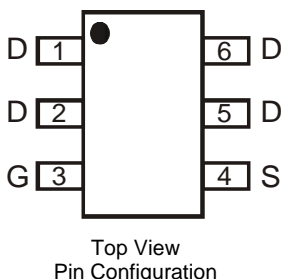
Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on) \text{ max}}$ | I_D $T_A = 25^\circ\text{C}$ |
|---------------|---------------------------------------|-----------------------------------|
| 60V | 44m Ω @ $V_{GS} = 10\text{V}$ | 5.0A |
| | 60m Ω @ $V_{GS} = 4.5\text{V}$ | 4.3A |

Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- DC-DC Converters
- Power management functions
- Backlighting



Features and Benefits

- 100% Unclamped Inductive Switch (UIS) test in production
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- **Lead, Halogen, and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

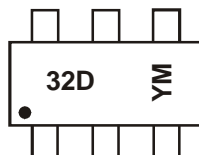
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.013 grams (approximate)

Ordering Information (Note 3)

| Part Number | Case | Packaging |
|--------------|--------|-------------------|
| DMN6040SVT-7 | TSOT26 | 3,000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free.
 2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
 3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



32D = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: X = 2010)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|------|------|------|------|------|------|------|------|
| Code | X | Y | Z | A | B | C | D |

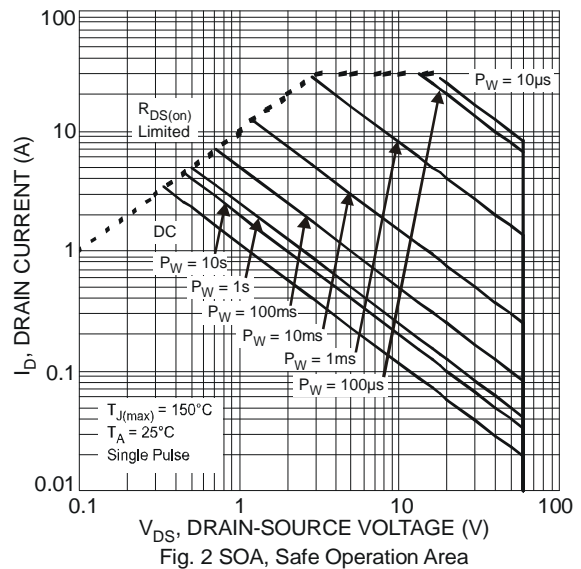
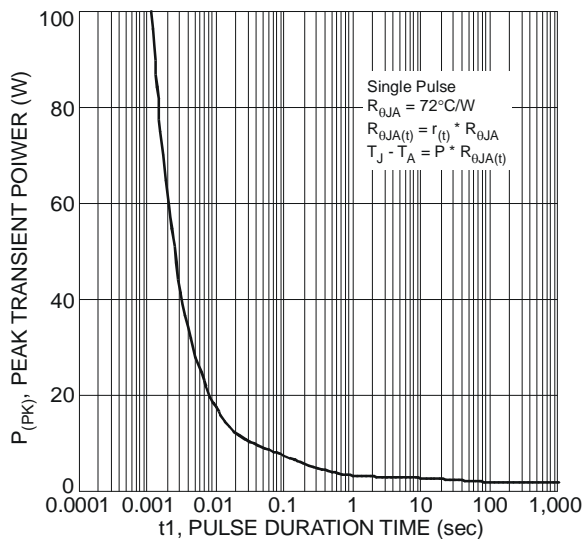
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

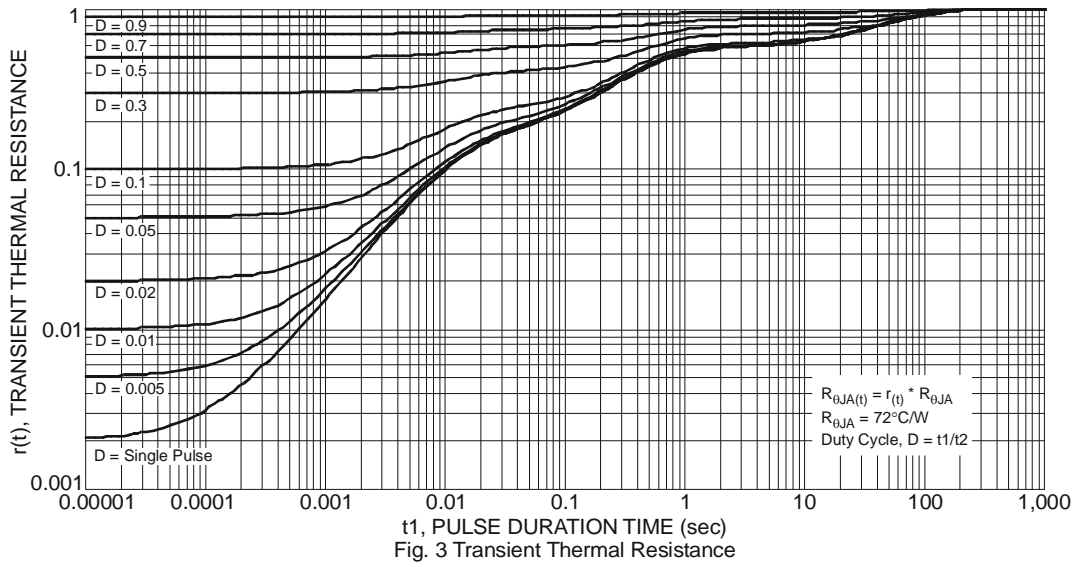
Maximum Ratings @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Units |
|---|--------------|------------------|------------|-------|
| Drain-Source Voltage | | V _{DSS} | 60 | V |
| Gate-Source Voltage | | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 5) V _{GS} = 10V | Steady State | I _D | 5.0 4.0 | A |
| | t < 10s | I _D | 6.3 5.0 | A |
| Continuous Drain Current (Note 5) V _{GS} = 5V | Steady State | I _D | 4.3 3.4 | A |
| | t < 10s | I _D | 5.4 4.3 | A |
| Maximum Body Diode Forward Current (Note 5) | | I _S | 2.1 | A |
| Pulsed Drain Current (10µs pulse, duty cycle = 1%) | | I _{DM} | 30 | A |
| Avalanche Current (Note 6) L = 0.1mH | | I _{AR} | 14.2 | A |
| Avalanche Energy (Note 6) L = 0.1mH | | E _{AR} | 10 | mJ |

Thermal Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | | Symbol | Value | Units |
|--|-----------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 4) | T _A = 25°C | P _D | 1.2 | W |
| | T _A = 70°C | | 0.75 | |
| Thermal Resistance, Junction to Ambient (Note 4) | Steady state | R _{θJA} | 106 | °C/W |
| | t < 10s | | 69 | °C/W |
| Total Power Dissipation (Note 5) | T _A = 25°C | P _D | 1.8 | W |
| | T _A = 70°C | | 1.1 | |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady state | R _{θJA} | 68 | °C/W |
| | t < 10s | | 44 | °C/W |
| Thermal Resistance, Junction to Case (Note 5) | | R _{θJC} | 20 | °C/W |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |





Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|------|------|------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 60 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 100 | nA | V _{DS} = 60V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | 1 | — | 3 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(on)} | — | 30 | 44 | mΩ | V _{GS} = 10V, I _D = 4.3A |
| | | — | 35 | 60 | | V _{GS} = 4.5V, I _D = 4A |
| Forward Transfer Admittance | Y _{fs} | — | 4.5 | — | S | V _{DS} = 10V, I _D = 4.3A |
| Diode Forward Voltage | V _{SD} | — | 0.7 | 1.2 | V | V _{GS} = 0V, I _S = 1A |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 1287 | — | pF | V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 57 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 44 | — | | |
| Gate Resistance | R _G | — | 1.2 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge (V _{GS} = 10V) | Q _g | — | 22.4 | — | nC | V _{DS} = 30V, I _D = 4.3A |
| Total Gate Charge (V _{GS} = 4.5V) | Q _g | — | 10.4 | — | | |
| Gate-Source Charge | Q _{gs} | — | 4.9 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 3.0 | — | | |
| Turn-On Delay Time | t _{D(on)} | — | 6.6 | — | nS | V _{GS} = 10V, V _{DD} = 30V, R _G = 6Ω, I _D = 4.3A |
| Turn-On Rise Time | t _r | — | 8.1 | — | | |
| Turn-Off Delay Time | t _{D(off)} | — | 20.1 | — | | |
| Turn-Off Fall Time | t _f | — | 4.0 | — | | |
| Body Diode Reverse Recovery Time | t _{rr} | — | 18 | — | nS | I _S = 4.3A, dI/dt = 100A/μs |
| Body Diode Reverse Recovery Charge | Q _{rr} | — | 11.9 | — | nC | I _S = 4.3A, dI/dt = 100A/μs |

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = 25°C
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

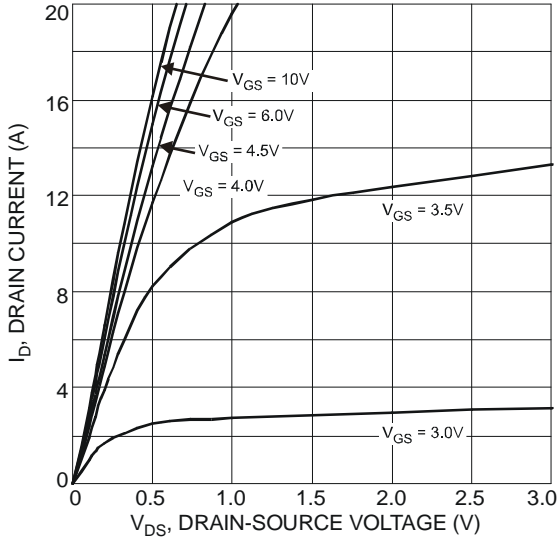


Fig. 4 Typical Output Characteristic

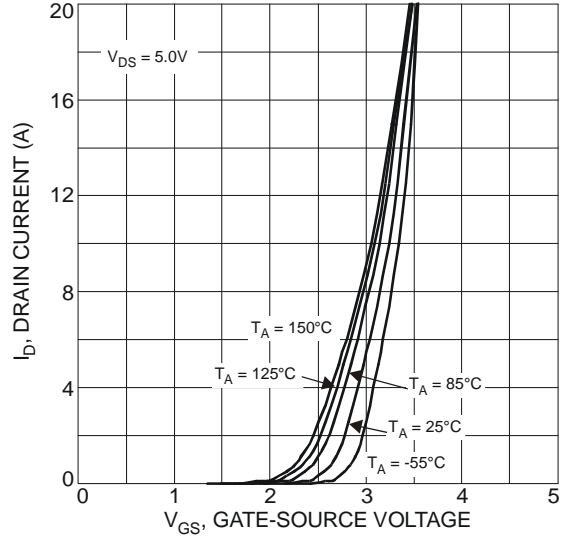


Fig. 5 Typical Transfer Characteristics

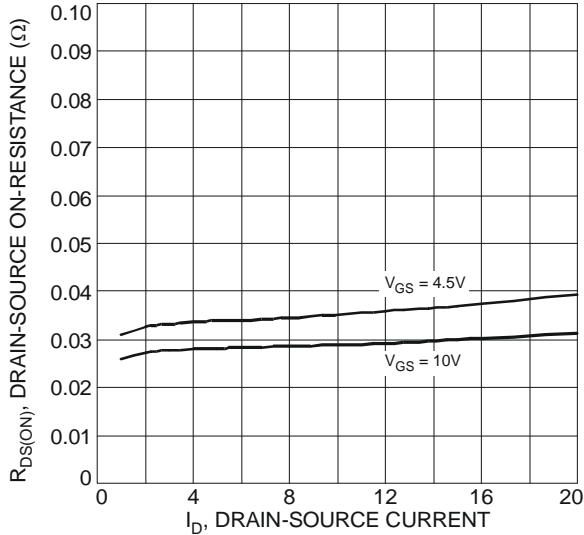


Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

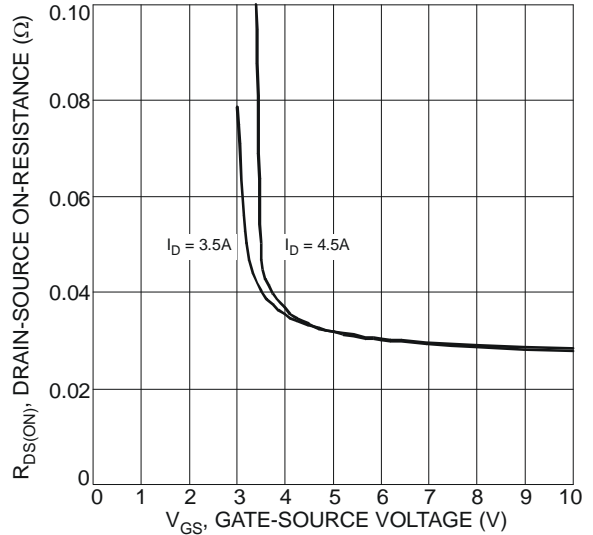


Fig. 7 Typical On-Resistance vs. Drain Current and Gate Voltage

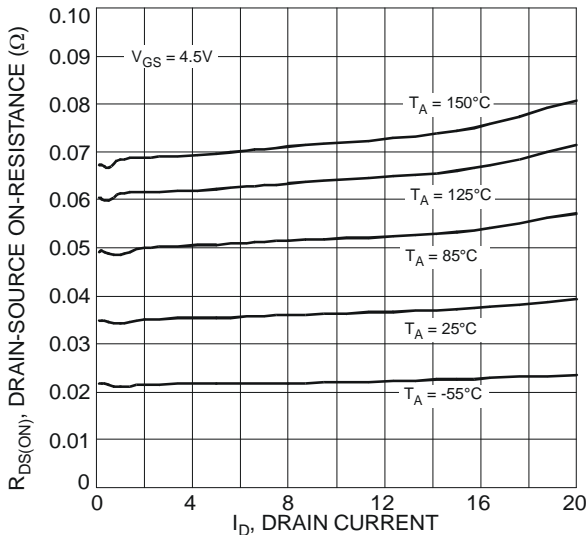


Fig. 8 Typical On-Resistance vs. Drain Current and Temperature

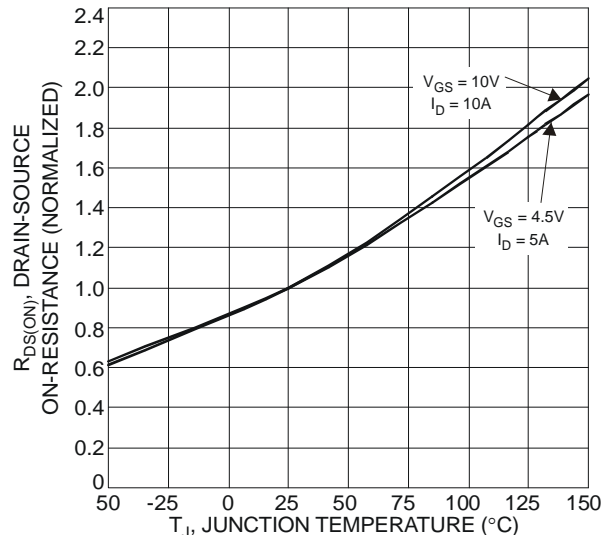


Fig. 9 On-Resistance Variation with Temperature

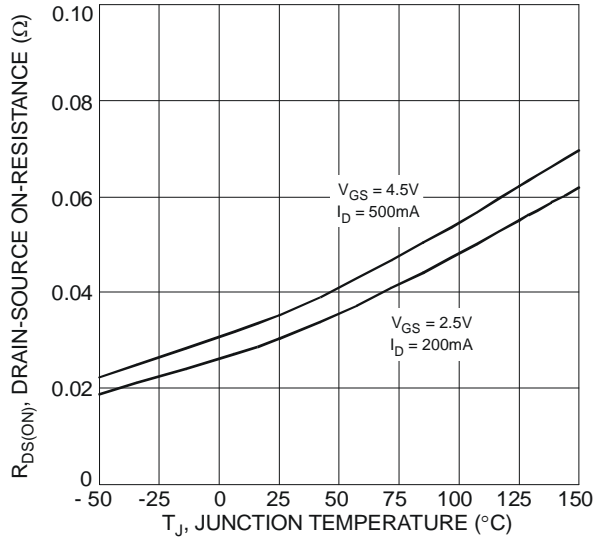


Fig. 10 On-Resistance Variation with Temperature

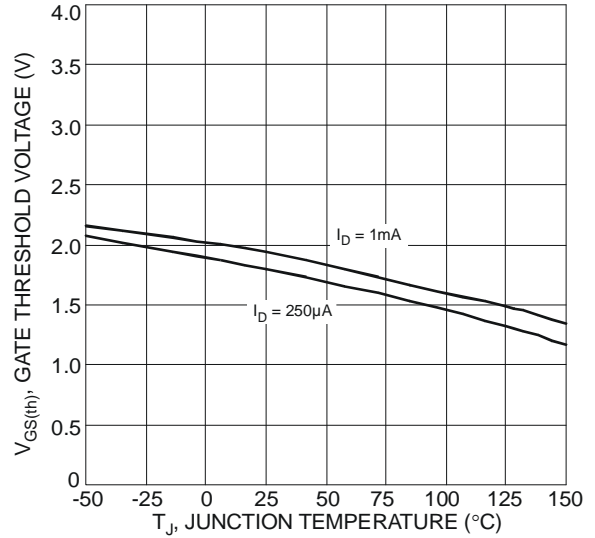


Fig. 11 Gate Threshold Variation vs. Ambient Temperature

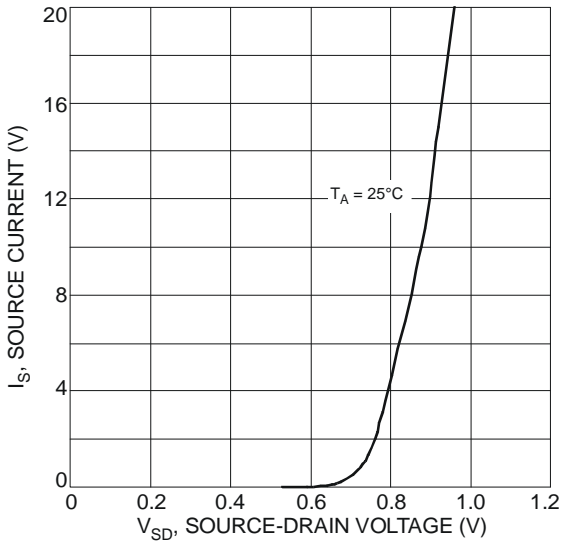


Fig. 12 Diode Forward Voltage vs. Current

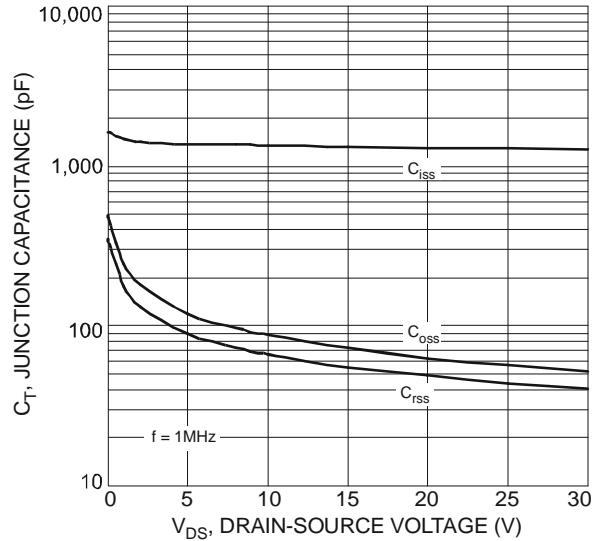


Fig. 13 Typical Junction Capacitance

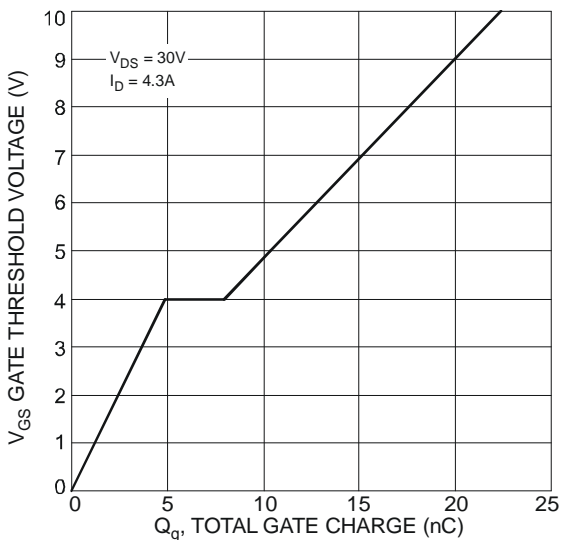
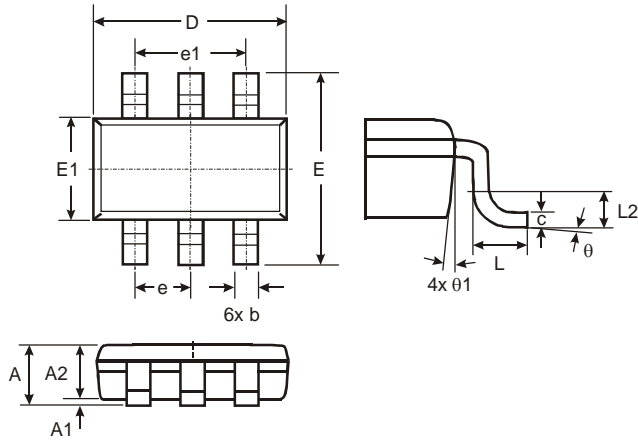


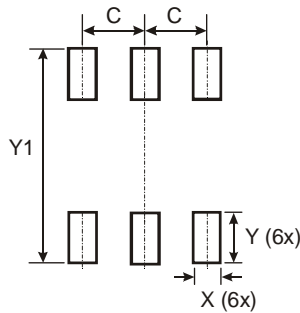
Fig. 14 Gate Charge

Package Outline Dimensions



| TSOT26 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | — | 1.00 | — |
| A1 | 0.01 | 0.10 | — |
| A2 | 0.84 | 0.90 | — |
| D | — | — | 2.90 |
| E | — | — | 2.80 |
| E1 | — | — | 1.60 |
| b | 0.30 | 0.45 | — |
| c | 0.12 | 0.20 | — |
| e | — | — | 0.95 |
| e1 | — | — | 1.90 |
| L | 0.30 | 0.50 | — |
| L2 | — | — | 0.25 |
| θ | 0° | 8° | 4° |
| $\theta1$ | 4° | 12° | — |
| All Dimensions in mm | | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.950 |
| X | 0.700 |
| Y | 1.000 |
| Y1 | 3.199 |

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